

REMARKS/ARGUMENTS

Though no related requirement was raised, Applicants have amended paragraph [0045] to include serial number information not available at the time of original filing.

Claims 1-27 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt in view of Fattic et al. Applicants respectfully traverse this rejection.

Basically, the present invention utilizes accelerations and torques of preselected transmission members in an open loop control of a transmission member speed. The invention may also employ a closed loop control effort responsive to at least one preselected transmission speed error.

Broadly, and consistent with claim 1, the invention is practiced in a speed control in conjunction with an electrically variable transmission utilizing an open loop motor torque controller operative to control a preselected transmission speed to a target speed as a predetermined function of preselected transmission torques and accelerations. Thus, in accordance with more particular implementations, and consistent with claims 3 and 4 for example, the preselected transmission member torques include input member and output member torques, and the preselected transmission accelerations include input member acceleration and output member accelerations. The invention may include a closed loop effort consistent with claim 2 operative to act upon a predetermined transmission speed error.

In accordance with a method for controlling a transmission member speed with the speed control of the present invention, and consistent with claims 7 and 12, a model including controlled and uncontrolled external torques and preselected transmission accelerations of the transmission corresponding to an active operating state or mode is provided. Values for the uncontrolled external torques and for the preselected transmission accelerations are provided into the model. The model is solved for values of the controlled external torques which are applied to the transmission. Thus, in accordance with more particular implementations, and consistent with claims 13 and 17 for example, the uncontrolled external torques include input member and output member torques. And, in accordance with more

GMC3147

11 of 14

particular implementations, and consistent with claims 16 and 17 for example, the preselected transmission accelerations include input member and output member accelerations. The invention may include a closed loop effort acting upon a transmission member speed error consistent with claims 8, 18 and 26 for example. Such transmission member speed error may include input member speed error consistent with claims 10, 11, 19 and 27 for example.

The Office Action recognizes that Schmidt fails to disclose an open loop motor torque controller operative in accordance with the present invention. In fact, Schmidt merely discloses an electrically variable transmission and is completely silent with respect to any control thereof. The Office Action, however, alleges that Fattic et al. disclose an open loop motor controller operative to control a preselected transmission speed to a target speed as a predetermined function of preselected transmission torques and accelerations.

Fattic et al. relates to regenerative vehicle launch. A vehicle in accordance with Fattic et al. includes a conventional multi-speed transmission, an engine, a motor/generator and a planetary gearset through which the engine, transmission and motor/generator are coupled. Fattic et al. teaches operating the motor/generator to apply a reaction torque to the planetary gearset during vehicle launches whereby the transmission is provided with an input torque and the reaction torque energy of the motor/generator is converted to electrical energy for charging a vehicle battery. Overall, Fattic et al. teaches a regenerative vehicle launch and convergence the motor/generator speed and transmission input member speed so that the members may be mechanically coupled via a clutch (C_R). Fattic et al. particularly teaches, as pointed out by the Office Action citation at column 6, lines 51-58, utilizing a speed differential between two separate rotating members - the motor/generator rotor (N_r) and the transmission input member (N_i) - to choose between use of an open loop torque control or a closed loop speed control of the motor/generator in effecting the convergence. Essentially, when speed differential is small enough, closed loop speed control of the motor/generator is used whereas when speed differential is large in comparison, open loop torque control of the

GMC3147

12 of 14

motor/generator is used. In any case, Fattic et al. merely discloses use of speed quantities in determining which one of an open loop torque control or a closed loop speed control will be used to converge the speed of a motor to a multispeed transmission input member to enable a mechanical clutch coupling therebetween.

Applicants' invention does not use a conventional multi-speed transmission, an engine, a motor/generator and a planetary gearset through which the engine, transmission and motor/generator are coupled. Applicants' invention is not concerned with a regenerative vehicle launch. Nor is Applicants invention concerned with converging the speeds of separate rotating members for any purpose let alone effecting a mechanical clutch coupling. Nowhere does either Schmidt or Fattic et al. teach or suggest the controls of the present invention (see for example independent claims 1) including an open loop motor torque controller operative to control a preselected transmission speed to a target speed as a predetermined function of preselected transmission torques and accelerations. Nowhere does either Schmidt or Fattic et al. teach or suggest the method of the present invention (see for example independent claims 7 and 12) including providing a model of the transmission including controlled and uncontrolled external torques and preselected transmission accelerations, providing values for the uncontrolled external torques into the model, providing values for the preselected transmission accelerations into the model, solving the model for values of the controlled external torques, and applying torque to the transmission in accordance with the values for the controlled external torques.

Applicants have not amended the claims because it is believed that the claims as they presently stand are patentably distinguishable over Schmidt and Fattic et al.

Applicants respectfully request withdrawal of all rejections. It is respectfully submitted that all pending claims are in condition for allowance and that same be allowed to proceed to issue.

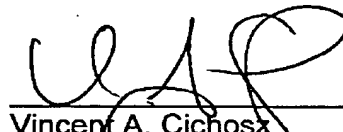
GMC3147

13 of 14

If the Examiner has any questions regarding the contents of the present response he may contact Applicants' attorney at the phone number appearing below.

Any fees associated with this response may be charged to General Motors Deposit Account No. 07-0960.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'V. Cichosz', is written over a horizontal line.

Vincent A. Cichosz
Registration No. 35,844
Telephone: (248) 676-2798

GMC3147

14 of 14